

IOR: L/MIC/17/25/15

NOTE ON THE ORGANIZATION

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AN INDIAN RAILWAY CORPS.

BY

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NOTE on the ORGANIZATION of an INDIAN RAILWAY CORPS for SERVICE OUTSIDE INDIA.

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Introductory.

"I would also bring to your Lordship's favourable notice Messrs.....of the Civil Staff of the Chinese Imperial Railways, but for whom it would have been difficult to have collected the Chinese employes, or indeed to have worked the Railway at all."

The above is an extract from Sir Alfred Gaselee's closing despatch on the operations in China.

The Germans, Japanese and Russians each brought a Railway battalion to China, but the British Contingent, sent from India, was represented by a Railway Section consisting of one Subaltern and forty men only. Hardly any country in the world is, however, in such a favorable position as India for sending out, without any strain on its resources, a thoroughly efficient Railway Corps capable of working and maintaining a very much longer line than the 256 miles that existed between Peking and Shanhaikuan. For India has over 25,000 miles of railway, with a certain number of military officers and men constantly employed on them, while all Indian railways have volunteer corps, most of them highly efficient.

Experience in
China.

Our Allies worked the line with practically a purely military staff, while under the British Railway Administration the working staff has been almost entirely civil. An exceptional opportunity has therefore been given of comparing one system with the other, and of observing the good and bad points of each.

Two facts stand out prominently.

First, that where time is the essential factor, the soldier—officer and man—is better than the civilian who is accustomed to fixed working hours, and to be judged entirely in his work by its cost in L. S. D.

Secondly, in purely technical work such as that of the Locomotive Department, which requires a lifetime of training and practice, the military personnel has failed, as under the conditions it must do. Capt. Twining R. E. was a brilliant exception, but he served a five years' apprenticeship in the workshops in Canada and as a result entered the Corps late, and is four years older than his contemporaries in it.

These two main facts indicate the lines on which a Railway Corps can best be organized; military as far as possible, while civilians with some military training should be employed on work requiring special technical training and practice, which a soldier's life does not permit.

Local
Conditions.

In considering the experience gained in China, the following points have to be borne in mind. First, owing to our system of employing a certain number of military officers and men in India in the Railway branch of the Public Works Department, those officers and men who came from India were trained experts in railway work, and they had the benefit of the advice and assistance of the local superior civil staff of the Chinese Imperial Railway, who all happened to be Englishmen. Secondly, there was no lack of skilled and unskilled Chinese labour, and the Chinese subordinate staff on the line were accustomed to serve under Englishmen, and some of them spoke English to a certain extent. Thirdly, the line has been guarded and patrolled throughout, but it has been free from any attempts to wreck it, though, owing to the thieving propensities of the Chinese, constant watch has to be kept against petty pilfering, even of material in the track, the removal of which might easily lead to serious accident.

Where most difficulty has been experienced was, at first, in the fewness and bad state of the engines on the line. Latterly we have felt the want of carriages and wagons, and we are still seriously hampered by the temporary arrangements necessitated by the absolutely complete destruction of the track and buildings wrought by the Boxers on the 100 miles nearest Peking, and by the want of money required for permanent works.

Three difficulties special to China were (1) the distance of any source of supply of railway materials, (2) ice preventing anything being landed during the three months December to February, and (3) having to deal with the troops of the Allies, consisting of no less than eight nations, with different customs and languages. Another special feature has been the amount of civil traffic that has been carried, even when military movements were heaviest.

Work to be
performed by a
Railway Corps.

In considering the organization that is required for dealing with a railway on service, the work can be divided into three heads:

- (1). The actual working of a line in all its branches to enable it to carry traffic.
- (2). The personnel that would be required if any large works of reconstruction or extension of new line have to be carried out, and.
- (3). The troops necessary for safe guarding the line from any isolated or organized attempts to wreck it or to interfere with its working.

Protection
Troops.

Dealing with the last first, South Africa would appear to give the largest number of troops required in a hostile country, and China the least. In China we have on station guard and detached posts 1,000 men, in addition to which there are some two thousand troops of various nationalities for patrolling to the flanks, or say a total of three thousand men for 276 miles of line. These numbers will of course vary with the country in which the operations have to be carried out, and with the intensity of the opposition offered.

Staff for
Working and
Maintaining an
existing line of
Railway.

Under the first head, that is the actual working of a line in running order, the work to be performed can be divided under the following heads:

- (a) Direction, including Station Staff Officers.
- (b) Engineering.
- (c) Locomotive.
- (d) Traffic.
- (e) Accounts and Records.
- (f) Stores.

Engineering
Department.

Leaving Direction for the minute, Engineering is the department which will employ the most men. The staff consists of officers and subordinates for supervision, and other labour, which must be skilled, for the actual maintenance: It is useless to have other than trained men in the gangs that have to keep the road in order. The staff that would be required for every hundred miles is one captain R. E., two subalterns R. E., four subordinates, and five hundred men divided into of gangs one head man and nine workmen.

It is in the Engineering department that the staff could be almost, if not entirely, military. We have R. E. Officers and military subordinates employed on railways in India, and on a line in a hostile country it would be necessary for the detached gangs who have to work anywhere and everywhere to be either protected by regular troops or be able to protect themselves. It is obvious that the latter will be the more economical method, both in money and in men, as the gangs could then form either a portion of the Protection troops, or be a valuable addition to them.

At this present time we have already Pioneer Regiments employed on railway work in India and also some Sapper companies. The latter are, in my opinion, too valuable and of too high a training for any of them to be kept entirely for railway work, though for certain work they would have to be called upon to help. The Pioneer Regiments, who had been trained to platelay and to maintain track,—a thing that is not learned in a day and which has a very important bearing on the speed and safety of trains—would be best suited for work of this nature. The technical training required would not be high and would not take them away unduly from their military duties or interfere with their other technical training, while they would be thoroughly trained soldiers who could defend themselves and the line. These men would be under their own officers for discipline and defence, but under the R. E. Railway Staff for work.

This personnel, while thoroughly trained for railway work, would cost the Government nothing in peace-time. for the R. E. officers would as now, be employed on railways in India, and the Pioneer Regiments would form part of the garrison of that country.

8. Locomotive Department.

This is purely technical work, in which it is useless to expect soldiers, either officers or men, to be in any way good. To attempt to make soldiers fit for this work would merely convert a good soldier into a bad mechanic. Men, to be any good, have to pass through five years in the shops and must be in constant practice. For drivers and mechanics, and therefore officers to control them, we must look entirely to the civil staff of the railways in India.

A scheme already exists, in case of a big war on the Indian Frontier, for the staff of the North Western Railway to be augmented by transfer from other lines, and a very simple modification of that scheme would give us a staff for employment outside Indian limits.

On the North Western Railway, a line 3,600 miles long owned and worked by the State, every employé other than those of purely Asiatic descent is a volunteer, and the other railways also have Volunteer Corps of great efficiency, so that even this, which I would propose to be a purely Civil department, would have men trained to use arms, and accustomed to some extent to military discipline. And the staff would not cost the Government anything during peace time, beyond a small retaining fee, as explained in para 16 below.

The staff I would propose for the same unit as before, 100 miles, would be three officers, thirty drivers, sixty firemen and five shop and shed foremen, with fifty inferior mechanics.

9. Traffic Department.

This, though not so severely technical as the Locomotive Department, still entails work for which a lengthened training and constant practice are necessary if the traffic is to be worked quickly and with the maximum of safety, so as to avoid accidents and the damage to line and stock, and the delay that accidents cause. We have a certain number of R.E. officers in the Traffic department of railways in India, and this number might with advantage be increased, for traffic training is a very great advantage to any officer who may be in the position of a Manager or Director of Railways.

The subordinate staff must, under existing conditions, be civil, but the Traffic Department is worked under exactly the same conditions as I have pointed out above in the case of the Locomotive Department, that is, that the men are trained and efficient volunteers. For the Traffic Department, for each 100 miles, we would require two officers, two Traffic Inspectors, twenty-five Stationmasters, and assistant Stationmasters, fifty guards and ¹⁰⁰~~100~~ Pointsmen and yardmen. This again would cost Government nothing additional in peace time, except the retaining fee in the case of the civilian staff.

10. Accounts Department.

It is scarcely necessary to point out that the Accounts and Records of the Railway are of a strictly technical description, and to prevent utter confusion it is necessary that an officer thoroughly trained in this work, with suitable staff, should be one of the first officers to get to work. If the records once get into confusion it will be hopeless to get them straight, and a Railway Accounts Officer of the Public Works Department would be the person best qualified to evolve a simple system of accounts and records, so as to prevent confusion arising and any consignment going astray. He would require an assistant to help him, two accountants and eighteen clerks. These men also would be obtained from the civil staff of railways, preferably those on the Government of India list, and they also would therefore cost the Government nothing extra in peace time beyond a retaining fee.

11. Stores Department.

An efficient stores Department is a great economy in time, a chief factor in military operations, and a Storekeeper should be one of the first men sent out. The stores that are required are chiefly engineering and locomotive. If a trained storekeeper is not available, and this department is one of those most undermanned and most poorly represented in India, its importance having not been at all recognized, the officer to be selected as a storekeeper should be an energetic engineering officer with a thorough knowledge of railway engineering, with an officer of the locomotive department to assist him. Four clerks would be required.

12. Direction.

The Director should, where possible,—and there are a large number of R.E. officers in India of the necessary training and experience,—be an officer who has had considerable experience in the management branch of Indian railways. He must have a deputy, so as to enable him to get out on inspection duty, which is one of the most important duties of any senior officer. The Direction should, therefore, at a minimum consist of an officer and his deputy. The actual strength required in the Director's office must necessarily depend on the nature of the work to be performed. For instance, here in China with all the different nationalities to deal with, with troops employed on the line

not only from every branch of the service but from every Contingent, there is a mass of detailed work and knowledge of rules and procedure required that would be quite unnecessary were the troops organised railway troops, or even belonging to one nation.

As regards Railway Staff Officers, experience in China has shown that the regimental officer performs the duties in a most efficient way after very little experience. No special training for these would therefore be necessary, and they could be appointed as actually required.

13. Head Quarter Staff.

The stores officer can correspond direct with the Director, and the Accounts officer will naturally have his offices next that of the Director, but in addition to the Director himself and his deputy, there must also be at Headquarters a head of each of the other departments. We therefore require, in addition to all the other officers already detailed :—

One Engineer in chief.

One Locomotive Superintendent.

One Traffic Manager.

and these officers may or may not require deputies or assistants, according to the length of line which has to be worked.

14. Clerical Staff.

From my experience on this line, I find a great deal of power is wasted owing to the absence of proper clerical staff. Officers have over and over again to do work that might just as well be performed by a clerk getting one fifth of the officer's pay. And not only is it a waste of power and time, but it is a waste of strength to tax an officer with matters of routine to the detriment of his efficiency when he has to deal with matters that more properly pertain to his work and position. He is fagged out with routine, when his brain should be clear and his mind fresh for more important work.

I regard this question of office staff as a very important one, and a valuable officer often breaks down when a clerk or two on low salaries would have saved him for further most useful work.

I consider that the Director of Railways should have one or more clerks in his office thoroughly conversant with all military regulations, and that in addition he should have one trained civil clerk for each of the other departments, and that one of the clerks should be an expert shorthand writer.

Similarly, all the officers in the other departments should have at least one clerk conversant with the duties of his department, and the heads of the departments should have two such clerks.

This may seem a great increase in clerical establishment, but it is the truest economy in the end, and it is far better to start work over officered and over clerked. If necessary, the extra men can be sent back; whereas the loss of efficiency entailed by overworking men and then their breaking down and having to be replaced by others who do not know what has gone before, should be avoided at any cost.

15. Tabular Statement of Staff required.

Placing my proposals regarding strength of establishment in tabular form, we get the following for a line 100 miles long :—

DEPARTMENT.	OFFICERS.			SUBORDINATES & CLERKS.			MEN.		
	Hd.Qrs.	District.	Total.	Hd.Qrs.	District.	Total.	Hd.Qrs.	District.	Total.
Direction	2	—	2	8	—	8	—	—	—
Engineering	1	3	4	2	7	9	—	500	500
Locomotive	1	3	4	2	8	10	—	140	140
Traffic.....	1	2	3	2	4	6	—	175	175
Accounts.....	2	—	2	2 & 18	—	20	—	—	—
Stores	1	—	1	4	—	4	10	—	10
TOTAL.....	8	8	16	36	19	57	10	815	825

DISTANCES ABOVE 100 MILES.

For length above 100 miles, the figures in the district columns would have to be increased proportionately.

In the Headquarters Staff, the Director would require one additional clerk for each 100 miles, and an officer for each 500 miles or portion of 500 miles. Engineering, Locomotive and Traffic would require another officer for each 200 miles or portion of 200 miles, and a clerk for each 100 miles. The Accounts need an additional officer for every 200 miles, and one accountant and 9 clerks for every 100 miles. The Stores department would have to be increased by one officer for every 200 miles, and two clerks and five men for every 100 miles.

STAFF REQUIRED FOR A LINE 500 MILES LONG.

DEPARTMENT.	OFFICERS.			SUBORDINATES & CLERKS.			MEN.		
	Hd.Qrs.	District.	Total.	Hd.Qrs.	District.	Total.	Hd.Qrs.	District.	Total.
Direction	3	—	3	12	—	12	—	—	—
Engineering	3	15	18	6	35	41	—	2500	2500
Locomotive	3	15	18	6	40	46	—	700	700
Traffic.....	3	10	13	6	20	26	—	775	775
Accounts.....	4	—	4	6 & 54	—	60	—	—	—
Stores	3	—	3	22	—	24	30	—	30
TOTAL.....	19	40	59	102	95	197	30	3975	4005

STAFF REQUIRED FOR A LINE 1,000 MILES LONG.

DEPARTMENT.	OFFICERS.			SUBORDINATES.			MEN.		
	Hd.Qrs.	District.	Total.	Hd.Qrs.	District.	Total.	Hd.Qrs.	District.	Total.
Direction.....	4	—	4	17	—	17	—	—	—
Engineering	6	30	36	11	70	81	—	5000	5000
Locomotive.....	6	30	36	11	80	91	—	1400	1400
Traffic.....	6	20	26	11	40	51	—	1550	1550
Accounts.....	7	—	7	11 & 99	—	110	—	—	—
Stores	6	—	6	22	—	22	55	—	55
TOTAL.....	35	80	115	182	190	372	55	7950	8005

The above scheme is simply what is required to work and maintain a line already existing, and the personnel provided will allow of the line being worked without any assistance whatever from local resources. It is a minimum, however, without which no force should start, if it is intended to work the railway effectively.

16. Cost of Staff in peace time.

As I have said before, the purely military element will involve no additional cost to Government; it will not mean any increase in the corps of Royal Engineers, for some of the officers now employed on the Buildings and Roads and the Irrigation branches can be transferred to Railways. Similarly, the use of Pioneers for plate-laying will not involve any increase in the total number of regiments in India.

Of the total strength for 1000 miles, we therefore get 45 officers, 40 subordinates and 6,000 men without extra cost. As regards the Civilian staff, I think a very efficient body of men could be obtained by offering the men serving on railways in India, an increase of 10% on their salary, up to a maximum of 50 Rupees per mensem per man, to enter their names on a list which might be called the Indian Railway Reserve List. These men should in all cases be efficient volunteers, and go through their training regularly every year exactly as they do now, and whenever a man fails to be efficient his name should be struck off the list and his allowance cease.

The Railway Reserve might in the first instance be sufficient for working a line 1,000 miles long; it should never be for less than 500. The reserve for 1,000 miles would involve a monthly expenditure of approximately R. 21,000 in retaining fees, a very small amount compared with the results attained, and it would avoid having to pay the ridiculous increases of salary that have been given to the Indian civil staff who have come out to China. It would also enable Government to form a picked body of men in peace time who could be ordered abroad, instead of the G.O.C. having to call for volunteers and be at the mercy of any head of department who might think his immediate interests in India of greater moment than Imperial interests abroad.

17. **Railway
Construction.**

As regards the staff for railway construction as distinguished from working, the circumstances will vary so much in each case that it is impossible to lay down any fixed numbers, and it would not be an economy to maintain in peace time a body of men for this special purpose. The Pioneers and other regiments could do the unskilled work, such as earthwork and rock blasting, and the Sappers and Miners might construct the temporary bridges and other skilled work; but in all cases of construction it would be absolutely necessary to employ large bodies of unskilled and skilled civil labor, which might have to be imported in places like Afghanistan, or be obtained locally, as in Chihli. Circumstances would vary so much that it is useless attempting to lay down any rule, and the numbers and classes necessary would have to be settled by the officer in charge of the railway.

18. **Concluding
Remarks.**

I have made the above attempts to lay down the principles that I consider should guide the formation of the working unit of a railway corps, and I have avoided detail as far as possible. If the general principles are accepted, I should be happy to work out the scheme in full detail. This would have to be done in communication with the Military and Railway authorities in India.

29th August, 1902.

C. A. R. BROWNE,

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CHINA FORCE.

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